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In Reply Refer To:

AESO/SE
2-21-99-F-367

November 28, 2000

Memorandum

To: Field Manager, Phoenix Field Office, Bureau of Land Management, Phoenix, Arizona

From: Field Supervisor

Subject: Biological Opinion: Reauthorization of Livestock Grazing on the South Vekol Allotment, Maricopa and Pinal counties, Arizona

This biological opinion responds to your request for consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your original request for formal consultation was dated April 1, 1999, and received by us on April 12, 1999. Your amended request was dated June 20, 2000, and received by us on June 22, 2000. At issue are impacts that may result from reauthorization of livestock grazing on the South Vekol Allotment, Maricopa and Pinal counties, Arizona. Your request for consultation and accompanying biological evaluation (Bureau of Land Management [BLM] 2000) found that the proposed action may affect the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) and the lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). You requested formal consultation in regard to the pygmy-owl and our concurrence that the proposed action may affect, but is not likely to adversely affect, the lesser long-nosed bat.

This biological opinion was prepared using information from the following sources: your June 20, 2000, request for consultation; the biological assessment for the project (BLM 2000); site visits; and our files. Literature cited in this biological opinion is not a complete bibliography of all literature available on the affected species, nor is it a complete review of the effects of livestock grazing activities on these species. A complete administrative record of this consultation is on file in our office. Our concurrence with your determination that the proposed action may affect, but is not likely to adversely affect, the lesser long-nosed bat, is included in Appendix 1 of this opinion.

CONSULTATION HISTORY

The BLM's Lower Gila South Resource Management Plan (RMP) (1985) contained general guidance for level of grazing management, rangeland developments, and monitoring on

allotments within the planning area, including the South Vekol allotment. At that time, the allotment was considered in the “maintain” category. Allotments in this category have range condition in satisfactory condition and no serious resource use conflicts or controversy exist. Stocking rates authorized at that time were 1,863 short-term animal unit months (AUMs) and 2,069 long-term AUMs. Percent of the Federal acres (49,349) in poor, fair, good, and excellent range condition were 3, 31, 34, and 32 percent, respectively, and trend was mostly static. The Service commented on the draft RMP in a letter dated May 2, 1985. No informal or formal consultation was conducted at that time.

On February 16, 1990, the BLM requested initiation of formal consultation on the Lower Gila South Habitat Management Plan (HMP), which included the South Vekol allotment. The HMP established the Vekol Valley Grassland Area of Critical Environmental Concern (ACEC) (3,500 acres) in the southern end of the South Vekol allotment. The HMP included specific management objectives and actions for the ACEC, and thus served as an ACEC management plan as well as an HMP. Under the plan, grazing would be managed and monitored closely in the ACEC and the area rested if forage utilization was found unacceptable. The Service, in a biological opinion dated May 15, 1990, found that the proposed action was not likely to jeopardize the continued existence of the Sonoran pronghorn, lesser long-nosed bat, and Tumamoc globeberry (*Tumamoca macdougalii*), previously listed as endangered.

In a memo dated December 19, 1991, the BLM requested comments from the Service on the draft range improvement maintenance plan and environmental assessment for the Table Top Wilderness. The southwestern quarter of the Table Top Wilderness is within the South Vekol allotment. The plan and assessment evaluated ways that range improvements within the wilderness area could be operated and maintained in accordance with the Wilderness Act of 1964. The Service, in a letter dated December 31, 1991, responded with a list of threatened and endangered species that may occur in the project area and comments on the plan. No formal consultation was conducted on the plan.

In a memo dated September 13, 1995, the BLM requested comments from the Service on an environmental assessment for mechanized or motorized use within the Table Top Wilderness, including that portion of the wilderness that lies within the South Vekol allotment. The Service responded with a list of threatened and endangered species that may occur in the project area. No formal consultation was conducted on this project.

The BLM requested initiation of formal consultation on the Lower Gila South RMP in a memo dated September 18, 1996. The Service responded with a biological opinion dated March 27, 1998. The biological opinion evaluated the effects of plan-level activities on the pygmy-owl, lesser long-nosed bat, southwestern willow flycatcher (*Empidonax traillii extimus*), and Sonoran pronghorn (*Antilocapra americana sonoriensis*). Plan level activities under consultation included general guidance for rangeland management and monitoring in accordance with the RMP, including grazing activities on the South Vekol allotment. The biological opinion found that the proposed action was not likely to jeopardize the continued

existence of the pygmy-owl, lesser long-nosed bat, southwestern willow flycatcher, or Sonoran pronghorn. However, only plan-level activities were covered by the opinion; any project level activities, such as specific grazing plans, allotment management plans, range improvement projects, etc. would need to be addressed under separate consultation.

In a letter dated July 18, 2000, the BLM requested initiation of formal consultation in regard to reauthorization of livestock grazing on the South Vekol allotment. This office responded with a memo dated July 28, 2000, confirming initiation of formal consultation and that a biological opinion was due on November 4, 2000. A draft biological opinion was e-mailed from this office to your office on November 8, 2000. Representatives from our offices met on November 13, 2000, to discuss the draft opinion and to make revisions as needed.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The BLM, Phoenix Field Office, is proposing to re-authorize a 10-year livestock grazing permit on the South Vekol allotment (Figure 1). The allotment is located between Gila Bend and Stanfield, Arizona, south of Interstate 8, east of the Barry Goldwater Range, north of the Tohono O'odham reservation, and west of Table Top Mountain. Land ownership in the allotment includes 49,349 acres of BLM lands, 1,280 acres administered by the State of Arizona, and 480 acres of private lands. The South Vekol allotment is classified as a perennial-ephemeral allotment, meaning that a base herd, up to and including the full grazing allocation (preference), could be run year-long with additional animals (normally steers) licensed during years with ephemeral bloom. Current authorized livestock use is 160 cows year long or 1,863 Animal Unit Month (AUMs - the amount of forage required to feed 1 cow with 1 calf for 1 month).

The allotment consists of four primary pastures, two large and two small. The western pasture is approximately 26,800 acres, the eastern pasture is approximately 19,000 acres, the ACEC pasture is approximately 3,000 acres, and the Vekol Wash pasture includes approximately 500 acres of BLM-administered land. There are several other small pastures adjacent to the Vekol Wash pasture and the associated livestock waters and corrals. Some of these small "pastures" are likely relics of past seeding projects. Most of these small pasture fences are in disrepair.

The current grazing operation consists of year-long use. The operator varies the size and location of the base herd depending on forage conditions. The permittee also holds permits on three adjacent allotments; Vekol, Table Top, and Santa Rosa, and subsequently is able to move livestock to areas with the best forage conditions among the four allotments. At times, the South Vekol allotment may be vacant due to market or forage conditions.

Figure 1 - General

Additional livestock may be licensed by the BLM through a supplemental permitting process when ephemeral forage is available. All supplemental “ephemeral” use will follow the conditions outlined in Guideline 3-5 of the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (see Attachment 1 of the BLM 2000), the administrative procedures described in the guidance criteria contained in Attachment 4 of BLM (2000), and the Phoenix Field Office policy of ensuring adequate forage remains after ephemeral use to provide necessary forage and habitat for desert tortoise and other wildlife.

Reauthorization of the permit includes revising current grazing management through the implementation of technical recommendations developed by an ID team. The recommendations are listed here with further discussion to follow.

- Construct a 1-5 acre livestock exclosure within the Vekol Valley ACEC
- Rest Vekol Wash Pasture from livestock grazing for 10 years
- Conduct periodic studies (10-year intervals) of saguaro recruitment levels of medium- to high-density saguaro stands
- Ensure utilization of browse plants remains at less than 20 percent in the Table Top Wilderness and less than 30 percent allotment-wide
- Monitor vegetation production, use pattern, and utilization, then reevaluate the authorized stocking levels by the end of 2003 based on the data collected - subject to available funding and staffing
- Authorize construction of a replacement livestock water on the west side of the allotment between South Vekol Well and the abandoned Marlboro Well, subject to the outcome of the analysis to be conducted by the end of 2003
- Conduct a cost benefit analysis of maintaining the spreader dikes and roads.
- Pursue opportunities to physically abate active head-cutting and soil erosion through 2010
- Designate and sign open vehicle routes in the ACEC and increase law enforcement patrols in the area. Route designations would occur through a public process with input from interested parties. No schedule has been developed for the route designation process. Beginning in November 2001, the BLM’s ranger from Ajo would devote more time to patrolling the Vekol Valley than occurs at present.
- Design and install an interpretive sign at the wilderness trailheads explaining that livestock grazing is a valid use of public lands allowed by the wilderness laws and educating the public of the historic significance of livestock grazing in the area. No schedule has been developed for implementation of this action.

Additionally, it is necessary to occasionally maintain earthen livestock waters by removing accumulated sediment. This activity occurs approximately once every 10 years. The use of a backhoe or front end loader is used to accomplish this activity. Some vegetation may be disturbed or destroyed by the use of heavy equipment, but disturbance is normally kept to the minimum necessary to complete the job. Excavated sediment is piled around the banks of the earthen tank and may be used to fill any breaches or weakened areas that may have developed.

Exclosure at Perennial Reservoir

A livestock exclosure is proposed for construction at the perennial reservoir located at T. 8 S., R. 1 E, Sect. 36. This exclosure will provide a comparison area to evaluate the impacts of livestock grazing on the vegetation and animals utilizing this water source. The exact dimensions of the exclosure will be determined at a later date, but is expected to be from one to five acres. Livestock would be excluded from a portion of the reservoir shoreline and surrounding area, including the mesquite bosque. This would increase ground cover at the shoreline which would sustain a variety of species that could serve as potential prey items for the pygmy-owl. The proposed exclosure would be located to include the most suitable cactus ferruginous pygmy-owl habitat in the area. Construction of the exclosure would be conducted between July 1 and Dec. 31 to avoid the breeding/nesting season of the pygmy-owl. If owls are found during surveys, to be conducted in the area surrounding the perennial water during the spring of 2001, the exclosure would be located so as to include the nest site.

Rest the Vekol Wash Pasture for 10 years

The Vekol Valley pasture will be rested for a period of 10 years, after which time the allotment in general, and this pasture in particular, will be re-evaluated to determine if the wash is recovering and if significant progress is being made towards meeting the Standards for Rangeland Health (see appendix 1 of BLM 2000).

Monitor Vegetative Production, Use Pattern and Utilization, then Re-evaluate the Authorized Stocking Levels by the end of 2003 based on the data collected.

The BLM proposes intensive monitoring and analysis to determine proper stocking levels on the allotment. Because of insufficiencies in past data collection and methods used to determine stocking levels, additional studies are proposed for implementation that will help determine if current stocking levels are appropriate. Data on livestock use patterns, vegetation production, and utilization will be collected, pending the availability of funding and personnel. Adjustments in stocking levels, if necessary, would occur by the end of 2003.

Ensure Utilization of Browse Plants Remains at Less than 20% in the Table Top Wilderness and Less than 30% Allotment-wide.

Utilization levels would remain below 20 percent in the Table Top Wilderness and below 30 percent allotment wide. Monitoring would be accomplished as described above, and as utilization reached these limits, cattle would be moved to another pasture or removed from the allotment as needed.

Authorize Construction of a Replacement Livestock Water on the West Side of the Allotment between South Vekol Well and the Abandoned Marboro Well, subject to the Outcome of the Analysis to be Conducted by the End of 2003.

If deemed beneficial in accordance with the analysis described above, a well would be constructed in T8S, R1E, section 28 to replace the defunct Marboro Well. The new well would help distribute cattle in the western pasture.

Conduct a Cost-Benefit Analysis of Maintaining the Spreader Dikes and Roads.

A cost-benefit analysis will allow BLM to make better informed decisions on whether the spreader dikes and roads should continue to be maintained. It will also assist in determining what, if any, efforts can be undertaken to curb erosion in this area.

Pursue Opportunities To Physically Abate Active Head-cutting and Soil Erosion through 2010.

The allotment evaluation identified erosion as a problem in portions of the South Vekol allotment. If physically and economically feasible, efforts will be made to impede further erosion and improve current conditions.

Designation and Sign Open Vehicle Routes in the ACEC and Increase Law-Enforcement Patrols in the Area.

Designation of open vehicle routes was called for in the Final Amendment and Environmental Assessment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan (BLM 2000). Vehicle use is allowed on open routes only. Within the Table Top Wilderness, vehicular use is prohibited. Open routes will be signed as open and law-enforcement patrols will be increased to ensure compliance with vehicular regulations.

Design and Install an Interpretive Sign at the Wilderness Trailheads Explaining that Livestock Grazing is a Valid Use of Public Lands Allowed by the Wilderness Laws and Educating the Public of the Historic Significance of Livestock Grazing in the Area.

This recommendation was added to educate and inform the public (wilderness and recreational users) of BLM's multiple use mandate. It is hoped that this information will improve the quality of the wilderness experience for these users.

Annual Monitoring Reports

The BLM will submit annual monitoring reports to the Arizona Ecological Services Field Office beginning Dec. 31, 2001. These reports shall briefly document for the current calendar year the effectiveness of the effect minimization measures proposed herein, implementation of any conservation measures described in the Service's biological opinion, and summaries of surveys for pygmy-owls and habitat evaluations.

Other Management Guidance

Management of the South Vekol allotment is also guided by a number of the policies and documents, including the following:

1. Lower Gila South Resource Management Plan, 1988, Objectives

- a. Maintain ecological rangeland condition in areas in good and excellent condition. (Vegetation)
- b. Improve ecological rangeland condition in areas of poor to fair condition. (Vegetation)
- c. Rangeland developments will be approved by cooperative agreement or permit with the objectives of improving livestock distribution and thereby improving rangeland in poor to fair condition or maintaining rangeland in good to excellent ecological condition. (Administrative)
- d. Arizona Standards for Rangeland Health: #1 Upland sites, #2 Riparian-wetland sites and #3 Desired Resource Conditions (see Attachment 1). (Vegetation and Administrative)

2. Lower Gila South Resource Management Plan, Amendment for Vekol Valley Grassland ACEC, 1988, Objectives

- a. Repair and maintain the existing watershed dike system and associated watershed fence. (Administrative)
- b. Manage Vekol Valley Grassland ACEC to ensure health and vigor of the tobosa grassland and protect amphibian habitat. (Vegetative)
- c. Intensively monitor rangeland condition and trend and adjust livestock grazing as necessary in order to maintain present grassland conditions. (Vegetation and Administrative)
- d. Install gully plugs, waterbars or other erosion structures to prevent excessive erosion on existing roads. (Administrative)

3. Strategy For Desert Tortoise Habitat Management On Public Lands In Arizona, 1990, Objectives

The livestock management objective states “Ensure that livestock use is consistent with the category goals, objectives and management actions of the Rangewide Plan and this

strategy.” The Category II Habitat Goals in the Arizona Implementation Strategy are to maintain stable, viable populations and halt further declines in tortoise habitat values.

4. Lower Gila South Habitat Management Plan 1980, Objectives

Enhance and maintain by year 2007, 970,000 acres of mule deer habitat by constructing strategic water developments, improving existing waters, monitoring range condition, and making livestock adjustments where necessary.

5. Maricopa Complex Wilderness Management Plan, Environmental Assessment and Decision Record, 1995, Objectives

- a. Maintain or enhance the natural character of the four Maricopa Complex wildernesses by prohibiting the construction of new livestock water developments within the wildernesses.
- b. Maintain the two present plant communities 1) the Arizona Upland community, consisting of palo verde-mixed cacti vegetation; and 2) the lower Colorado river community in which creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are the dominant plants by resting impacted areas from livestock grazing for a specified period if foraging standards (less than 20 percent utilization of trees and shrubs) are exceeded and by, under certain conditions, maintaining eight existing livestock control fences using mechanized transport and allowing the use of chainsaws for maintaining 13 fences.

6. Arizona Standards and Guidelines (also see Appendix 1 of the BE)

The Standards and Guidelines include three standards and criteria for judging whether the standards have been met. The standards are 1) Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform; 2) Riparian wetland areas are in properly functioning condition; and 3) Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

Desired Resource Conditions of the Arizona Standards and Guidelines (Standard No. 3) are developed using ecological site information with consideration for all multiple uses and are a further quantification of Land Use Plan and Activity Plan objectives.

7. Ephemeral Grazing Policy

Where ephemeral extensions would be authorized after March 1, such extensions would occur in 30-day increments to allow accurate assessments of utilization and when ephemeral extensions should be terminated.

The objectives from the Land Use Plans and Activity Plans are expressed in terms of vegetation conditions or desired resource conditions. These vegetation conditions are described as long-term objectives. The short-term objectives describe allowable use levels by livestock that will lead to the achievement of the long-term objectives. The administrative decisions pertinent to grazing listed above provide management guidance and do not equate to vegetation or long-term objectives.

Administration of grazing on this allotment will use “acceptable use” levels described in the BLM/Service Guidance Criteria for Determinations of Effects of Grazing Permit Issuance and Renewal on Threatened and Endangered Species for lesser long-nosed bat and cactus ferruginous pygmy-owl (U.S. Bureau of Land Management/Fish and Wildlife Service 1999). The Desired Resource Condition objectives consider these guidance criteria as they describe the vegetation conditions necessary to maintain habitat for these endangered species, as required by Standard 3 and the Endangered Species Act.

Long-Term Objectives for the Allotment

Key Area # 1 (Key areas are displayed as Study Sites 1-5 on Figure 2 of BLM 2000)

- 1) Maintain ecological condition in good or late seral stage through 2025.
- 2) Maintain vegetative structural diversity through 2025.

Key Area #2

- 1) Maintain ecological condition in good or late seral stage through 2025.
- 2) Maintain vegetation ground cover at ≥ 20 percent through 2025.

Key Area #3 (ACEC)

- 1) Maintain ecological condition in good or late seral stage through 2025.
- 2) Maintain vegetation ground cover at ≥ 25 percent through 2025.

Key Area #4 (Wilderness)

- 1) Maintain ecological condition in good or late seral stage through 2025.
- 2) Maintain vegetation ground cover at ≥ 10 percent through 2025.

Key Area #5 (Vekol Wash)

- 1) Maintain ecological condition in good or late seral stage through 2025.
- 2) Maintain perennial vegetation ground cover at ≥ 20 percent through 2025.
- 3) Improve native grass composition from trace to 2 percent by 2025.
- 4) Stabilize erosive soil surfaces in areas of active erosion by 2025.

Short-Term Objectives

- 1) Maintain ≤ 30 percent utilization on key species at Key Areas 1 and 2 through 2005.
- 2) Maintain ≤ 20 percent utilization on key species at Key Areas 3 and 4 through 2005.
- 3) Maximize perennial plant recruitment in the Vekol Wash Pasture through 2010.
- 4) Minimize soil surface disturbance in the Vekol Wash Pasture through 2010.

Figure 2 - Waters and Studies

Key Species: Key species are generally an important component of a plant community. Key species serve as indicators of change within the study area.

Study Area 1 -	Blue Palo Verde (PAFL6) Catclaw Acacia (ACGR)
Study Area 2 -	Wolfberry Species (LYSP) Whitethorn Acacia (ACCO2)
Study Area 3 -	Tobosa Grass (HIMU2)
Study Area 4 -	Range Ratany (KRPA)
Study Area 5 -	Mesquite (PRJU) Various Three-awn (ARSPP)

Additional Proposed Measures to Minimize Adverse Effects

In addition to the various measures described above in the proposed action that would limit adverse effects of grazing, the BLM also proposes the following additional measures. These measures are taken from the biological opinion for the Lower Gila South RMP:

Cactus Ferruginous Pygmy-Owl (from BLM's proposed action)

1. Habitat description: The BLM will work with the Service, the U.S. Forest Service, and Arizona Game and Fish Department in a cooperative effort to refine the owl's habitat profile and delineation of distribution for the cactus ferruginous pygmy-owl. The habitat profile will include habitat features necessary to support breeding populations for owls and a profile for the subset of Sonoran Desert scrub that is likely to support cactus ferruginous pygmy-owls.
2. Mapping: Map suitable habitat within the planning area based on the Service's most current habitat profile and distribution map by March 27, 2001.
3. Survey: Survey for the presence of owls on BLM-administered lands over all mapped areas of suitable habitat within a timeframe identified in an action plan developed in cooperation with the Service. Priorities for survey include:
 - a. Survey before any habitat disturbing activity (this applies to all suitable habitat, regardless of the status of the mapping effort described in number 2 above);
 - b. Areas in proximity to occupied or recently (within the last 10 years) occupied habitat.
 - c. Historic localities; and
 - d. Likely historic habitat, based on historic localities and habitat profile.

Note: BLM has contracted for surveys of the South Vekol allotment and other areas during late winter and spring of 2001. If owls are found within the South Vekol allotment during 2001 surveys, BLM will reevaluate the potential impacts of the grazing operation and may reinitiate consultation, based on an evaluation of effects to the species.

4. Habitat Management: Maintain habitat features necessary to support breeding populations of the pygmy-owl within their historic range:

- a. Maintain essential habitat features on suitable habitat as identified in the most current Service-approved habitat profile for the owl.
- b. Review ongoing activities for effects on essential habitat features needed by pygmy-owls, and modify activities, where necessary, to sustain the overall suitability of the habitat for pygmy-owls. Priority will be given to activities in or near occupied or recently (within the last 10 years) occupied habitat.

5. Review: Management direction for the pygmy-owl (including such things as habitat profiles, habitat categorization, mapping, and surveys) will be reviewed with the Service annually. Adjustments will be made, as necessary, based on these findings, other new information, or accepted recovery prescriptions.

Lesser Long-Nosed Bat (from the terms and conditions in the 1998 Lower Gila South RMP biological opinion)

1. (The BLM will) assess the amount of food plants currently present within area where livestock grazing is occurring. Adjust grazing levels in order to maintain current levels of food plants for the bat.
2. Grazing levels will not be increased until it is known that sufficient food plants exist and are being sustained.

Additional information about the proposed action can be found in BLM (2000).

STATUS OF THE SPECIES

Cactus Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum*)

The Service listed the Arizona population of the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) on March 10, 1997. The Service designated as critical habitat approximately 731,712 acres of riverine riparian and upland habitat in Pima, Cochise, Pinal, and Maricopa counties in Arizona on July 12, 1999. Pygmy-owls are small birds, averaging 6.75 inches in length. The average weight of a male is 2.2 oz, while females average 2.6 oz. Pygmy-owls are reddish-brown overall, with a cream-colored belly streaked with reddish-brown. Their crown is lightly streaked, and paired black-and-white spots on the nape suggest eyes. They have

no ear tufts and their eye color is yellow. Their tail is reddish-brown with darker stripes, and is relatively long for an owl.

The pygmy-owl, in the Order Strigiformes, Family Strigidae, is one of four subspecies of ferruginous pygmy-owl. Pygmy-owls are known to occur from lowland central Arizona south through western Mexico to the States of Colima and Michoacan, and from southern Texas south through the Mexican States of Tamaulipas and Nuevo Leon. It is unclear at this time if the ranges of the eastern and western populations of the ferruginous pygmy-owl merge in southern Mexico. Additional information is needed to determine if eastern and western populations are genetically distinct. Other subspecies are found to the south in Mexico and Central and South America.

Pygmy-owls are known to use many habitat types. Within Arizona, they are known to occur in riparian woodlands, mesquite bosques, semi-desert grasslands, and Sonoran desert scrub communities as well as in non-native habitat within these communities. While plant species diversity differs between these communities, there are certain unifying characteristics in each of these occupied habitat types. These unifying characteristics include the presence of vegetation in a fairly dense thicket or woodland, the presence of trees or cacti large enough to support cavity nesting, and elevations below 4,000 ft.

According to early survey reports, prior to the mid-1900s the pygmy-owl was "not uncommon," "of common occurrence," and a "fairly numerous" resident of lowland central and southern Arizona in cottonwood forests, mesquite-cottonwood woodlands, and mesquite bosques along the Gila, Salt, Verde, San Pedro, and Santa Cruz rivers and various tributaries (Breninger 1898 *in* Bent 1938, Gilman 1909, Swarth 1914). A disproportionately low number of historical records from desert scrub habitats may be due to the focus of early collection efforts along rivers where humans tended to concentrate, while the upland areas received less survey effort. An additional hypothesis offered by Johnson and Haight (1985) is that pygmy-owls adapted to upland associations and xeroriparian habitats in response to the demise of Arizona's riparian bottomland woodlands.

The range of the pygmy-owl in Arizona extends from the International Border with Mexico north to central Arizona. The northernmost historic record for the pygmy-owl is from New River, Arizona, approximately 35 miles north of Phoenix, where Fisher (1893) reported the pygmy-owl to be "quite common" in thickets of intermixed mesquite and saguaro cactus. The Museum of Vertebrate Zoology contains a clutch of four eggs collected by G. F. Breninger on May 18, 1898, in Phoenix, Maricopa County. One additional record exists for this northern portion of the pygmy-owl's range, and is filed under R. D. Lusk with the United States National Museum Smithsonian Institution. This record indicates that five eggs were collected at Cave Creek on April 12, 1895. Pygmy-owls were also detected in central Arizona at the Blue Point Cottonwoods area near the Highway 87 crossing of the Verde River on the Fort McDowell Indian Reservation in 1897, 1949, 1951, and 1964 (Arizona Game and Fish Department unpubl. data, Phillips *et al.* 1964). Additionally, pygmy-owls were detected at Dudleyville on the San Pedro River as recently as 1985 and 1986 (Arizona Game and Fish Department unpubl. data, Hunter 1988).

The easternmost record for the pygmy-owl is from 1985 at the confluence of Bonita Creek and the Gila River. Other records from this eastern portion of the pygmy-owl's range include a 1876 record from Camp Goodwin (current day Geronimo) on the Gila River, and a 1978 record from Gillard Hot Springs, also on the Gila River. Pygmy-owls have been found as far west as the Cabeza Prieta Tanks, Cabeza Prieta National Wildlife Refuge, Yuma County in 1955 (Monson 1998).

Forty-one adult pygmy-owls were documented in Arizona in the spring of 1999 (S. Richardson, Arizona Game and Fish Department, unpublished data, 1999). Six adult pygmy-owls were documented in southern Pinal County, 11 adults in the northwest Tucson area, 19 adults in riparian woodlands and xeroriparian habitats in semidesert grasslands and upland Sonoran desert scrub habitat in southern Arizona, and five adults at Organ Pipe Cactus National Monument. Nesting was confirmed at at least 11 of these sites, with 37 young documented.

Surveys conducted in 2000 resulted in 24 confirmed pygmy-owl sites (i.e. nests and resident owls sites) and several other unconfirmed sites (S. Richardson, unpublished data; T. Tibbitts, Organ Pipe Cactus National Monument, unpublished data; Fish and Wildlife Service, Phoenix, unpublished data). A total of 34 adult pygmy-owls were confirmed. Nesting was documented at seven sites, and 23 fledglings were confirmed. However, as in 1999, over 50 percent of fledged young did not survive (S. Richardson, unpublished data). A total of nine juveniles were known to have successfully dispersed from their natal areas in 2000. Successful dispersal was not confirmed at two nests with four fledglings. The status of the remaining fledglings is unknown; however, they are presumed dead.

Pygmy-owls are considered non-migratory throughout their range by most authors, and have been reported during the winter months in several locations, including Organ Pipe Cactus National Monument (R. Johnson, unpubl. data, 1976, 1980, T. Tibbitts, pers. comm., 1997). The pygmy-owl's diverse diet includes birds, lizards, snakes, insects, and small mammals (Bendire 1888, Sutton 1951, Sprunt 1955, Earhart and Johnson 1970, Oberholser 1974) and frogs (Proudfoot *et al.* 1994a).

Pygmy-owls nest in a large cavity in a tree or large columnar cactus. These cavities may be naturally formed (e.g., knotholes) or excavated by woodpeckers, and nest lining material may or may not be present. Pygmy-owls begin nesting activities in late winter to early spring. At a nest in Arizona in 1996, copulation was observed on March 31, and egg laying was estimated to have taken place from April 6 to April 11, with the onset of incubation estimated to have taken place from April 7 to April 12. Hatching was estimated at May 9. Fledging was confirmed on June 4 (Abbate *et al.* 1996). Radio telemetry studies conducted by Arizona Game and Fish Department in the Tucson basin in 1998 showed dispersal distances of young fitted with transmitters to be up to six miles (in straight line distance), typically occurring from July through September (S. Richardson, Arizona Game and Fish Department, pers. comm., 1998).

Additional information on the status and biology of the cactus ferruginous pygmy-owl can be found in Hunter (1988), Millsap and Johnson (1988), Abbate *et al.* (1996), Mays (1996), Proudfoot (1996), Proudfoot and Johnson (2000), Monson (1998), Russell and Monson (1998), and Cartron and Finch (eds) (2000).

ENVIRONMENTAL BASELINE

Environmental Setting

The South Vekol allotment is located approximately 25 miles southeast of Gila Bend in Maricopa and Pinal counties, Arizona. Elevation in the Vekol Valley ranges from 1,760 feet to 3,535 feet near the peak of Table Top Mountain. The allotment includes about 10,300 acres of the Table Top Wilderness. Livestock grazing is a permitted action under the Arizona Desert Wilderness Act of 1990. Approximately 4,800 acres of the Table Top Mountains are above 2,396 feet. These areas are typically unsuitable for cow/calf livestock grazing due to steep slopes, rocky terrain, and the long distance to water. Steers, when available, may utilize the steeper areas; however, there are no livestock waters to hold livestock in these areas. There are four wildlife waters (primarily for bighorn sheep use) around the base of the mountain, two of which are in wilderness. A pipe-rail fence surrounding these waters excludes them from livestock use (BLM 2000).

Lower elevation areas receive an average of 3-7 inches of precipitation per year. The mountains receive an average precipitation of 7-10 inches per year. The nearest weather station, near Stanfield (approximately nine miles to the northeast), recorded an average of 6.57 inches of rain per year, with approximately two years in three receiving less than 7 inches (Sellers and Hill 1974).

The vegetation in this allotment includes approximately 36,000 acres (70 percent) of vegetation principally in the lower Colorado river valley subdivision of Sonoran desert scrub (Turner and Brown 1982). Creosote, triangle-leaf bursage (*Ambrosia deltoidea*), range ratany (*Krameria* sp.), white bursage, devil's club ground cholla *Cylindropuntia stanleyi*, crucifixion thorn (*Castela emoryi*), and honey mesquite (*Prosopis velutina*) comprise the major vegetation species within this subdivision. Approximately 9,000 acres (18 percent) of this allotment is comprised of the Arizona Upland subdivision of Sonoran desert scrub (Turner and Brown 1982). Major species within this vegetation type include saguaro (*Carnegiea gigantea*), blue palo verde (*Cercidium floridum*), little-leaf palo verde (*Cercidium microphyllum*), ocotillo (*Fouquieria splendens*), ironwood (*Olneya tesota*), buckthorn cholla (*Cylindropuntia acanthodes*), mesquite, whitethorn acacia (*Acacia constricta*), brittlebush (*Encelia farinosa*), barrel cactus (*Ferocactus* sp.), and wolfberry (*Lycium* sp.).

The South Vekol allotment contains the 3,449 acre Vekol Valley Grassland ACEC, which contains, in part, a remnant tobosa (*Hilaria mutica*) grassland. The ACEC is located in the southern portion of the South Vekol allotment. In the 1940's-1960's, BLM constructed a series of more than 30 water-spreader dikes for erosion-control and to increase forage production for

livestock. Only one dike is deep enough to hold water year-round. It provides habitat for a number of amphibian species, two of which have very limited distributions in the United States. Although not its original purpose, the dike is now used as a dependable livestock water (Figure 2). Many of the remaining dikes have silted in and some are breaching and eroding. These areas are virtually impenetrable to livestock because of heavy mesquite cover. The vegetation around the dikes provides hiding and foraging cover for a variety of wildlife species, many of which are potential prey species for the cactus ferruginous pygmy-owl. The ACEC's grassland, mesquite bosque, and wash vegetation make up the remaining vegetation components in this allotment (12 percent).

The Vekol Wash Pasture is a relatively small area (500 BLM acres sandwiched between two private parcels) that sustains year-long livestock use (Figure 1). It is an incised wash that has sustained severe degradation due to a variety of factors. The installation of water-spreader dikes, breaching of dikes and resulting erosion and gully formation, road construction, livestock grazing, and possibly other factors have all contributed to the degradation of this system. When the dikes were constructed, the wash was cleared of vegetation and 640 acres above the dikes were seeded with a mix of mostly exotic species such as Bermuda grass, Lehmann lovegrass, blue panic grass, and yellow sweet clover. Bermuda grass continues to grow where moisture is present and is used heavily by livestock.

Some areas of Vekol Wash exhibit active head-cutting, whereas other portions of the wash show signs of healing, as indicated by the presence of regeneration and cryptobiotic crusts along older cuts. A single row of trees line the wash and include palo verdes, mesquite and ironwood.

Livestock grazing since 1988 has averaged 109 cattle yearlong, or 1,312 AUMs. During that time, ephemeral grazing was authorized once, in 1995, when 236 ephemeral AUMs were authorized. Authorized AUMs vary with precipitation and plant production, and peaked at 1,862 in 1989, 1995, and 1998, and was reduced to 99 in 1997 (BLM 2000).

A 1980-1981 range condition analysis of the South Vekol allotment was described in the Lower Gila South RMP (BLM 1988). Range condition at that time was excellent on 32 percent of the BLM lands, good on 31 percent, fair on 31 percent, and poor on three percent of BLM lands. Range condition trend was primarily (96 percent) static. The BLM did not provide maps to the Service indicating the distribution of condition classes on the allotment; however, the Vekol Wash pasture was generally in fair or poor condition. Condition classes correspond to community seral stages as follows. Percentages are percent similarity to potential natural communities:

- Early seral stage (0-25 percent) = poor
- Mid seral stage (26-50 percent) = fair
- Late seral stage (51-75 percent) = good
- Potential natural community (76-100 percent) = excellent

Five key areas, selected by an interdisciplinary team to represent significant range sites on the allotment, were found in 1999 to be in late seral or potential natural community condition. Utilization at these sites ranged from 2-6 percent. AUMs authorized in 1999 totaled 724. No ephemeral grazing was authorized in 1999. Key areas are placed in vegetated washes or in the Arizona upland subdivision of Sonoran desert scrub.

Monitoring of percent area in bare ground, litter, basal vegetation, and gravel has occurred at one site on the allotment, and a comparison site on a grazed area on the Tohono O'odham Reservation. The BLM (2000) reports no meaningful differences between the two sites.

Two sites were selected for studying saguaro recruitment within the allotment, including a site near the southern Table Top Mountain Wilderness trailhead, and at a second site near the northern wilderness trailhead. Saguaro were present at the southern trailhead, saguaros were present as follows: small (<1 foot tall): 12 plants, medium (1-6 feet tall): 11 plants, large (>6 feet tall): 19 plants. At the northern trailhead site, size class distribution was as follows: small: 2, medium: 1, and large: 19. BLM (2000) concludes from these data that "recruitment is occurring at rates adequate to maintain the current populations and comparable with that occurring in other areas with similar densities." However, no rationale is presented to support this statement. Demographics of saguaro populations can be expected to vary dramatically through time and are dependent upon a variety of biotic and abiotic factors, particularly periodic freezing temperatures that kill young plants and damage or kill older individuals (Steenburgh and Lowe 1977). Saguaro seedlings and small plants can be difficult to find and are probably underestimated. Populations trends cannot be determined from a single survey of saguaro size class distributions. The Bureau's proposal to track saguaro demographics at ten-year intervals should, over a period of several decades, provide some data on long-term trends. However, without monitoring in a similar, ungrazed site, it will be difficult to draw conclusions about the effects of grazing management.

Cactus Ferruginous Pygmy-Owl Occurrence and Habitat

No records of pygmy-owls are known from the South Vekol allotment. The nearest possible detections of pygmy-owls were near Johnson Well, Sand Tank Mountains, approximately three miles west of the western boundary of the allotment. Biological consultants for the Army believed they heard a pygmy-owl calling at Johnson Well on two occasions in 1992 (US Army Corps of Engineers 1996). Service personnel from this office heard a possible pygmy owl call just northwest of Johnson Well in January 1993. However, neither of these detections were confirmed with observations of the birds. Another unconfirmed detection occurred on the Goldwater Range in 2000, approximately 15 miles west of the southwestern boundary of the allotment. The closest confirmed detection is from southwestern Pinal County, less than 25 miles east of the southeastern allotment boundary. Another confirmed detection in 2000 occurred approximately 42 miles to the southwest in northeastern Organ Pipe Cactus National Monument



Figure 3: Potential pygmy-owl habitat at the base of Table Top Mountain. Vekol Valley is in the distance to the southwest.

in 2000. No critical habitat occurs in or near the allotment. The nearest pygmy-owl critical habitat is approximately 45 miles to the east of the allotment.

As described in the “Status of the Species” above, in Arizona the pygmy-owl is a species of arboreal desert scrub and riparian woodland or bosque. The species has been recorded in the Lower Colorado River subdivision of Sonoran desert scrub, but within this community, it is only likely to occur along drainages or in other sites that support leguminous trees and columnar cacti.

Most recent records for the species are from valleys or flats in the Arizona Upland subdivision of Sonoran desert scrub, or areas with mesquites or other trees or saguaros within semi-desert grasslands. Within the allotment, areas most similar to recently occupied habitat are found at the base of Table Top Mountain (Figure 3), in major drainages, including Vekol Wash and washes that drain into it from the east and west. Potential habitat also exists in the form of mesquite thickets that have developed around spreader dikes and impoundments. Habitat has been enhanced as a result of these artificial structures. BLM (2000) estimated that the allotment contains less than 1,000 non-contiguous acres of suitable or potential pygmy-owl habitat. To date, no pygmy-owl surveys have been conducted in the Vekol Valley.

EFFECTS OF THE PROPOSED ACTION

Effects to pygmy-owls are primarily indirect as a result of effects of the livestock program to the habitat of the species. However, if pygmy-owls occur in the allotment over the life of the action, direct effects to individual birds are possible, as well. No critical habitat exists in or near the action area, thus none would be affected. Potential effects of the action on the pygmy-owl include: 1) construction of range improvement projects (fences within the Vekol Valley

ACEC, possible construction of a new water) that destroys nesting or foraging habitat, 2) possible increased dominance or introduction of novel nonnative annuals as a result of grazing, which may alter fire regimes and increase the chance that a wildfire would occur in occupied pygmy-owl habitat, 3) reduced productivity and vigor of desert ecosystems, 4) trampling and browsing of vegetation cover, including saguaros and their nurse plants, 5) reduction of cryptobiotic crusts, 6) soil erosion and compaction, and 7) reduced water infiltration rates and increased runoff, leaving less water for plant production. These effects are described herein:

Direct Effects:

The BLM proposes a 1-5 acre livestock enclosure within the ACEC at the perennial reservoir. Fence construction activities would occur outside of the pygmy-owl nesting season (January 1-June 30); thus nesting pygmy-owls would not be directly affected. The BLM proposes preconstruction surveys, and if pygmy-owls were found outside the nesting season in areas to be disturbed, they would reevaluate potential effects, and may reinitiate, based on an evaluation of effects, prior to construction.

The perennial reservoir is also proposed to be used as a cattle trap during livestock gathering activities (BLM 2000). Livestock gathering may occur at any time of the year, but most often in spring and fall. If pygmy-owls are using the site at the time, cattle trapped in the area and gathering activities could result in short-term disturbance to pygmy-owls. However, with the best habitat within the enclosure, disturbance is likely to be minimal. BLM would limit the number of cattle to be trapped at the water to no more than 25 to further reduce the likelihood of significant effects. The cattle at present do not penetrate very far into the mesquite bosque, except along open routes. The mesquite is too dense for the cattle to move through it, further reducing the likelihood of direct effects to pygmy-owls.

Construction of a new well would take place outside of the breeding season for pygmy-owls; thus construction would not affect any nesting pygmy-owls. Degradation of habitat around the new water will likely occur due to future concentrations of cattle in the area. The location of the proposed well is an upland site in a creosote flat. Rich, Sonoran desert scrub communities characteristic of pygmy-owl habitat are absent. Because of poor habitat, the likelihood of pygmy-owls occurring in the vicinity of the new water is very low. Thus, no direct effects to pygmy-owls are anticipated as a result of construction and operation of this new water.

Indirect Effects:

Habitat within the 1-5 acre enclosure would benefit; vegetation would not be subject to grazing and trampling impacts. The best pygmy-owl habitat would be captured within the enclosure, including any nest sites identified during the spring 2001 surveys. However, livestock trapping and gathering activities at the perennial water cattle could result in habitat disturbance, including breaking of branches from trees and shrubs, trampling of seedling and sapling shrubs and trees, and trailing through the brush as cattle are gathered. However, as mentioned above, the best

pygmy-owl habitat and any nest sites will be captured inside of the exclosure. Because the mesquite bosque is too dense for the cattle to penetrate, damage to shrubs and trees is only expected along existing trails and around the edge of the bosque, outside of the exclosure. Concentrations of cattle are also expected to degrade vegetation at and near the new livestock water as a result of grazing and trampling; however, the site of the new water is considered poor pygmy-owl habitat.

The effects of grazing on Sonoran desert scrub communities have not been well-studied. Although grazing in semidesert grassland and Chihuahuan desert scrub can cause a decrease in grasses and increases in shrubby species (Bahre 1995, Holecheck *et al.* 1994), this effect has not been documented in Sonoran desert scrub. Grazing can result in reduced shrub cover (Webb and Stielstra 1979) and reduced desirable shrubs (Orodho *et al.* 1990) in Mojave desert scrub and Great Basin desert scrub, respectively. In general, grazing practices can change vegetation composition and abundance, and cause soil erosion and compaction, reduced water infiltration rates, and increased runoff (Klemmedson 1956, Ellison 1960, Arndt 1966, and Gifford and Hawkins 1978), leaving less water available for plant production (Dadkash and Gifford 1980).

Cryptobiotic crusts, consisting of lichens, fungi, algae, mosses, and cyanobacteria are important soil stabilizers of desert soils (Kleiner and Harper 1972, 1977; Belnap 1992). These crusts decrease wind erosion (Brady 1974 in Anderson *et al.* 1982) and have a significant effect on soil stability and rates of water infiltration (Kleiner and Harper 1972; Kleiner and Harper 1977; Belnap 1992; Belnap and Gardner 1993). Cyanobacterial soil crusts have been shown to increase soil retention through absorbency of the polysaccharide sheath material that surrounds groups of living filaments. These crusts also act to increase the availability of many nutrients in sandy soils (Belnap 1992; Belnap and Gardner 1993).

Grazing caused considerable damage to cryptobiotic crusts resulting in less stable soil conditions at Navajo National Monument, Arizona (Brotherson *et al.* 1983). In Utah, Marble and Harper (1989) found that late winter grazing caused significant reductions in cryptobiotic crusts. Areas trampled by humans in Arches National Park exhibited a 90 percent lower infiltration rate than untrampled areas, resulting in overall water loss to the system (Belnap unpubl. report). Therefore, trampling may result in the reduction of soil stability, soil fertility, and soil moisture retention (Belnap 1992). Although the relationships between saguaros, agaves, and cryptobiotic crusts have not been investigated, changes in soil characteristics due to trampling of cryptobiotic crusts by cattle are likely to adversely affect saguaro and agave establishment and growth. Recovery of cryptobiotic crusts may take a long time, especially for the lichen and moss components of the crust (Belnap 1993). Cryptobiotic crusts will not likely recover significantly from previous disturbances under a seasonal grazing regime. Without these crusts, the reestablishment of the potential natural community may not occur (Menke 1988).

Disturbance of soils, including cryptobiotic crusts, and removal of vegetation by grazing combine to increase surface runoff and sediment transport, and decrease infiltration of precipitation

(Gifford and Hawkins 1979, Busby and Gifford 1981, Blackburn 1984, DeBano and Schmidt 1989, Belnap 1992, Belsky and Blumenthal 1997). Effects are cumulative and interactive. Loss of vegetation cover and trampling of soils promote further deterioration of soil structure, which in turn accelerates vegetation loss (Belsky and Blumenthal 1997). These changes tend to increase peak flows in drainages (DeBano and Schmidt 1989), making water courses more "flashy", which promotes erosion, downcutting, and loss of riparian and xero-riparian vegetation (Belsky *et al.* 1999).

The intensity of damage to cryptobiotic crusts and vegetation caused solely by cattle is assumed to be directly proportional to the AUMs of forage used per pasture (BLM 1980). The most severe impacts occur in areas used for loading and unloading cattle, supplemental feeding, watering sites, and salt licks. In these areas, effects to habitat, such as vegetation removal, soil compaction (Orodho *et al.* 1990) and resultant reduction in soil moisture (Daddy *et al.* 1988), and presumably crushing of cacti, are most prevalent.

Effects to saguaros and their nurse plants resulting from grazing have been studied by several authors in Sonoran desert scrub in Arizona. Saguaros may be affected both directly and indirectly by grazing activities. Direct impacts may occur from trampling of young saguaros, grazing of nurse plants which results in reduction or removal of protective cover, or grazing of the young saguaros themselves (Abouhalder 1992). Nurse plants, which shade sensitive saguaro seedlings (Shreve 1931), may be reduced by grazing, and germination sites may be adversely altered due to soil compaction, erosion, and reduced infiltration. Benson (1982) noted that seedbeds of saguaros have been locally obliterated by grazing. Neiring *et al.* (1963) found that enhanced reproduction of saguaros on slopes was correlated with reduced localized levels of grazing.

Steenbergh and Lowe (1977) examined saguaro density and recruitment within Saguaro National Park which, until recently, was grazed by livestock. In addition, Burgess (1964) examined saguaro populations on the Tonto National Forest. These studies found that in Sonoran desert scrub, direct destruction of young saguaros has resulted from the trampling by cattle seeking shade and forage beneath the crowns of desert trees, particularly palo verdes and mesquite. They also found that livestock grazing has had the greatest impact in non-rocky habitats where germination, establishment, and survival of young saguaros are most directly dependent upon the physical protection of other vegetation. Grazing in rocky habitats has had far less impact upon young saguaro recruitment. They summarized that grazing has reduced the density of saguaro populations by decreasing the number of sites suitable for germination and establishment of young plants by increasing exposure to natural mortality-causing factors. Therefore, since most recent nest cavities used by pygmy-owls have been in saguaros in non-rocky habitat, activities which affect saguaro recruitment could be significant.

Grazing in desert scrub communities probably have mixed effects on fire frequency and behavior. Weedy nonnative plants, split grass (*Schismus barbatus*), checker fiddleneck (*Amsinckia intermedia*), filaree (*Erodium cicutarium*), brassica (*Brassica tournefortii*), and cheatgrass (*Bromus rubens*) have benefitted from grazing, while native perennial bunchgrasses,

which are highly palatable grazing forage, have become less abundant in many areas (Berry and Nicholson 1984, Kie and Loft 1990, Minnich 1994). When nonnative annual plants cure, they can form continuous stands of fine fuels that carry fire. These fine fuels have resulted in increased fire frequency in desert scrub (Rogers and Steele 1980, 1988; Minnich 1994). Many desert shrubs and cacti, including saguaro, are poorly adapted to fire and decline in burned areas. For example, Esque *et al.* (2000) reported mortality of adult saguaros in excess of 20 percent after a fire in desert scrub at Saguaro National Park. Although cattle grazing probably contributed to the spread of nonnative annuals into desert scrub communities, heavy grazing can also reduce fuel loads, making it less likely that fire will occur. The Vekol Valley area contains a full suite of nonnative annual plants. It is unlikely that proposed cattle grazing would result in introduction of novel nonnative species.

Grazing also affects density of potential pygmy-owl prey. Jones (1981) found that grazing reduced lizard abundance and variety in a number of habitats in western Arizona. Pianka (1966, 1986) discussed the importance of vegetation structure, and found vegetation communities with increased plant structures supported more lizard species than those with less structure. In general, complex vegetation communities with a high degree of species diversity and structural heterogeneity provide habitat for many prey species including birds, insects, and mammals.

Changes to the structure and composition of riparian and Sonoran Desert scrub communities can result in increased susceptibility of the pygmy-owl to its aerial predators, lack of suitable nesting structures, and habitat fragmentation. The Service is particularly concerned with year-long grazing in Sonoran Desert scrub habitat. The Service believes that this type of grazing can, in the long-term, decrease potential nesting habitat for the pygmy-owl by suppressing regeneration of trees in riparian areas and by inhibiting survival of saguaros.

Pygmy-owls co-exist with livestock grazing in Sonoran desert scrub northwest of Tucson and in Altar Valley southwest of Tucson. Pygmy-owls have also been found in areas of heavy livestock use in Mexico. Thus, although adverse effects to the pygmy-owl and its habitat may occur from livestock grazing activities, the birds are at least somewhat tolerant of this type of disturbance. In many semidesert grasslands, overgrazing has contributed to successful invasion by mesquite and other shrubby species (Bahre 1995). In these areas, including the Altar Valley, grazing may have caused changes in vegetation communities that favor pygmy-owls. Although Vekol Wash supports a tobosa grassland community, no semidesert grassland occurs in the Vekol Valley allotment.

No data exist to judge whether or to what extent the effects just described have been operating in the South Vekol allotment. However, range condition analysis conducted in 1980-1981 suggested that substantial portions of the allotment (34 percent) were in early or mid seral condition in which the existing plant community exhibited a similarity index of less than 50 percent to the site's potential natural community. As discussed in BLM (2000), the causes of habitat degradation is due in part to past activities in the Vekol Wash area, such as construction of the spreader dikes, clearing and seeding of nonnative vegetation, roads, etc. However, these

activities affected a relatively small portion of the allotment and cannot account for degradation observed on a third of the allotment. Grazing has been the primary use of the area, and is likely the primary cause of habitat degradation. Condition trend was static in 1980-1981, suggesting that degraded conditions were not necessarily due to grazing practices at the time, but may have been caused by poor management in years past.

The BLM has proposed to rest the public lands in Vekol Valley Wash for a period of 10 years, and limit utilization to less than 20 percent in the Table Top Wilderness and less than 30 percent allotment-wide. As utilization limits are reached, cattle would be moved to another pasture or off the allotment.

Holechek (1988) and Holechek *et al.* (1998) found that, in desert scrub, average utilization rates of 25-35 percent are appropriate for maintaining range condition. Within that range, several factors determine whether a low, medium, or high value should be selected. Holechek *et al.* (1998) suggest that on ranges in good condition with relatively flat terrain and good water distribution, the higher utilization limit may be appropriate. If the range is in poor or fair condition, or the allotment has thin soils, rough topography, and poor water distribution, the lower utilization rate may be appropriate.

Using the guidance from Holechek (1988) and Holechek *et al.* (1998), BLM's proposed utilization rates of 20 and 30 percent are probably appropriate to maintain areas of good and excellent range condition, and to restore, over time, degraded conditions elsewhere. Utilization will be monitored at key sites. A concern is that data collected at the five key sites in 1999 only showed 2-6 percent utilization and the areas were in late seral condition or potential natural community. Thus, the key areas may not receive much grazing use. These areas may not be truly representative of utilization allotment-wide.

Cattle occasionally stray off of the South Vekol allotment into the adjacent Goldwater Range. Trespass cattle and their sign have been observed on occasion by Service personnel in the Sand Tank Mountains on the Range. The Sand Tank Mountains support a very diverse and structurally complex vegetation community that is potential pygmy-owl habitat, and as noted in the environmental baseline, pygmy-owls may have been detected in the Johnson Well area. Although cattle trespass from the allotment onto the Goldwater Range, they have not occurred in great enough numbers or frequently enough to significantly impact vegetation there.

Exclusion of grazing from Vekol Valley Wash will initiate recovery of vegetation communities in that pasture. Proposed efforts to curb erosion and head-cutting, route designation, and increased law enforcement will begin to address recreational and other impacts that have adversely affected habitats in the Vekol Wash area. The BLM also proposes to intensively monitor vegetation production and livestock use patterns and utilization (pending availability of funding and personnel). Based on the data collected, adjustments in stocking levels would be made by the end of 2003, if needed to adhere to Arizona Standards and Guidelines and other applicable grazing policies. A new water source may also be constructed on the west side of

the allotment if needed for better distribution of cattle. A determination of whether or not the water is needed would be based on the 2003 analysis.

Implementation of the 30-day ephemeral extension policy should ensure that cattle use primarily ephemeral forage and do not switch to perennial shrubs at the end of the season when ephemerals dry out or are eliminated by grazing. This policy should maintain low utilization rates on perennial shrubs and trees in those years when ephemeral grazing is authorized.

The allotment is 97 percent BLM lands. The other three percent is a mix of state and private land. Because of the preponderance of BLM lands, grazing on the State and private lands would probably not be economical if the BLM lands were not grazed. Thus, grazing on the these non-Federal lands is considered interrelated and interdependent to the proposed action, and effects of grazing on the State and private lands in the allotment are effects of the action. The State and private lands are grazed in a manner similar to the BLM lands, thus the description of the effects of the proposed action herein are applicable to these lands.

Cumulative Effects

Cumulative effects are those adverse effects of future non-Federal (State, local government, and private) actions that are reasonably certain to occur in the project area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project. Effects of past Federal and private actions are considered in the Environmental Baseline. Because of the extent of Federal lands in the project area, few if any projects are anticipated that would not be the subject of section 7 consultation. Small inholdings of State and private lands could potentially be developed for residential or other purposes, but such development is unlikely given their remote nature. The allotment is bordered on the south and southeast by the Tohono O'odham Reservation; Tribal lands are used primarily for grazing. Take of listed species resulting from a future non-Federal activity could be authorized by the Service with a section 10(a)(1)(B) incidental take permit.

CONCLUSION

After reviewing the current status of the cactus ferruginous pygmy-owl, the environmental baseline for the action area, and the anticipated effects of the proposed grazing program for the South Vekol allotment, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the cactus ferruginous pygmy-owl, nor is it likely to result in adverse modification or destruction of critical habitat. We make these findings for the following reasons:

1. No critical habitat occurs in or near the action area, thus none will be affected.
2. The BLM proposes to rest the Vekol Valley Wash pasture for ten years (this pasture contains suitable pygmy-owl habitat that is degraded, in part, as a result of grazing activities).

3. Maximum utilization rates would not exceed 20 percent in the Table Top Wilderness and 30 percent in the remainder of the allotment. These utilization rates are compatible with maintenance of good to excellent range condition and restoration of degraded sites.
4. BLM proposes to exclude from cattle grazing the best pygmy-owl habitat at the perennial reservoir, including any nest sites identified during the spring 2001 surveys. The BLM proposes further measures to reduce the potential for disturbance of pygmy-owls or habitat at the perennial reservoir.
5. The BLM proposes other measures to ensure maintenance and improvement of range condition, including route designations and signing, increased law enforcement, pursuit of opportunities to curb erosion, and intensive monitoring followed by reevaluation of authorized stocking levels and the need for an additional livestock water in 2003.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is any take of a listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to require any applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

AMOUNT OR EXTENT OF TAKE

No pygmy-owls are currently known from the allotment; however, suitable habitat exists and no surveys have been conducted for the species. Thus, pygmy-owls may occur on the allotment

currently or during the life of the project. If pygmy-owls occur on the allotment during the life of the project, we do not anticipate take of these owls for the following reasons: 1) construction activities would occur outside of the breeding season, 2) at the perennial reservoir, the proposed enclosure, limiting number of cattle to be trapped at any one time to 25, and because the mesquite bosque is mostly impenetrable to cattle, proposed activities would not result in harm, harassment, or other forms of take, 3) proposed utilization limits are compatible with maintenance of pygmy-owl habitat, and 4) cattle would be excluded from the Vekol Wash Pasture.

Because no take is anticipated, no reasonable and prudent measures or terms and conditions are needed. Continuing surveys of suitable habitats and for pygmy-owls may yield new information suggesting the proposed action may affect the cactus ferruginous pygmy-owl in a manner or to an extent not previously considered. If this occurs, reinitiation of consultation will be warranted [50 CFR 402.16(b)].

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the Huachuca water umbel. In furtherance of the purposes of the Act, we recommend implementing the following actions:

1. The BLM should implement the pygmy-owl recovery plan, when such plan is finalized, in regard to grazing management and other activities in the Vekol Valley.
2. The BLM should evaluate whether the five key areas are representative of the allotment in regard to utilization rates, and adjust the location of these areas if they are not.
3. The Bureau should promptly complete surveys of pygmy-owl habitat and for the birds themselves, as proposed in the Lower Gila South RMP section 7 consultation.
4. The BLM should consider closing the South Vekol allotment to yearlong grazing, and designate the allotment for ephemeral use only, or close the allotment to grazing to protect resource values.
5. The BLM should work with the permittee to halt trespass of cattle from the allotment onto the Goldwater Range.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species, the Service requests notification of implementation of any conservation actions.

REINITIATION NOTICE

This concludes formal consultation on BLM's proposal to reauthorize livestock grazing on the South Vekol allotment in Maricopa and Pinal counties, Arizona. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation, if it is determined that the impact of such taking will cause an irreversible and adverse impact to the species.

If we may be of further assistance in this matter, please contact Jim Rorabaugh (x238) or Sherry Barrett (520/670-4617) of my staff.

/s/ David L. Harlow

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Appendix 1: CONCURRENCES

Lesser Long-nosed Bat

The lesser long-nosed bat was listed as endangered in 1988. No critical habitat has been designated. This animal is a medium size, leaf-nosed bat. It has a long muzzle, a long tongue, and is capable of hover flight. These features are adaptations that allow the bat to feed on nectar from the flowers of columnar cacti such as the saguaro (*Carnegiea giganteus*) and organ pipe cactus (*Stenocereus thurberi*), and from paniculate agaves such as Palmer's agave (*Agave palmeri*) and Parry's agave (*A. parryi*). The lesser long-nosed bat is migratory and found throughout its historic range from southern Arizona and extreme southwestern New Mexico through western Mexico and south to El Salvador. The bats arrive in southwestern and south central Arizona in April, and occupy maternity roosts until July or August when most bats move to southeastern Arizona. This migration to southeastern Arizona corresponds to the cessation of most columnar cactus blooming and fruiting in southwestern Arizona and the beginning of the agave flowering period in southeastern Arizona, particularly Palmer's agave. Most lesser long-nosed bats depart Arizona by mid September, but a few stay as late as November or may overwinter (US Fish and Wildlife Service 1994, Sidner 2000).

No lesser long-nosed bat roosts are known from the Vekol Valley and no lesser long-nosed bats have ever been detected there. However, night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at 15 miles, and in Mexico at 25 miles and 38 miles (one way)(Dalton *et al.* 1994; V. Dalton, Tucson, pers. comm., 1997; Y. Petryszyn, University of Arizona, pers. comm., 1997). Saguaro pollen was found in fecal samples from lesser long-nosed bats in the Chiricahua Mountains, suggesting these bats may fly as far as 70 miles one way to foraging areas (the nearest saguaros are 70 miles away)(Howell 1994). At least two maternity roosts lie within 25 miles of the eastern boundary of the South Vekol allotment, including the Old Mammon Mine (less than 20 miles distant) and a roost in the Sawtooth Mountains (about 25 miles away). The Old Mammon Mine is a major maternity roost that typically supports between 1,000 and 5,000 lesser long-nosed bats. Given the proximity of these roosts, presence of forage species (especially saguaros) on the allotment, and the ability of the bat to fly long distances between roosts and foraging areas, lesser long-nosed bats likely forage on the allotment.

Effects determinations for lesser long-nosed bats in regard to grazing activities should conform to the procedures outlined in the BLM/Service's January 1999 "Guidance Criteria for Determinations of Effects of Grazing Permit Issuance and Renewal on Threatened and Endangered Species". Three conditions apply in determining whether an action may affect the lesser long-nosed bat. If any one of the criteria are triggered, the action may affect the lesser long-nosed bat.

1. Habitat for the species or primary constituent elements of critical habitat may be modified.

No critical habitat exists for the species. However, as discussed in the Effects of the Proposed Action, saguaro recruitment could be adversely affected through trampling of seedlings,

destruction of nurse plants, and adverse effects to soils and cryptobiotic crusts. Thus, the proposed action triggers this criterion.

2. Improvement of potential habitat for the species or development of primary constituent elements of critical habitat may be precluded or impeded.

Areas of the South Vekol allotment that have potential to support forage plants already support such plants, although as noted above, the density of such plants may be affected by the proposed action. The proposed action does not trigger this criterion.

3. An individual may be disrupted from breeding, sheltering, feeding, or sheltering-related activities or otherwise taken.

Although the proposed action may adversely affect the density of forage plants, we believe this effect will be slight due to relatively low authorized utilization rates (20-30 percent). This reduction in forage plant density is not likely to result in take of lesser long-nosed bats because saguaros are still abundant on the allotment and occur in abundance in other areas within foraging distance of nearby roosts. No roosts are known from allotment, thus no direct effects to bats or their roosts are anticipated. The proposed action does not trigger this criterion.

Because the action may affect the lesser long-nosed bat, we then apply the criteria for determining whether the action may affect, but is not likely to adversely affect, the lesser long-nosed bat. Again, if any of the criteria are triggered, the action would adversely affect the bat and formal consultation would be required.

1. Lesser long-nosed bats would not be taken or predisposed to taking due to grazing-related activities (e.g. access to roosts provided by roads and trails and impacts due to other structural and non-structural projects).

For the reasons given above for criterion 3, no take of lesser long-nosed bats is anticipated. The action does not trigger this criterion.

2. Roost sites would not be modified or destroyed or predisposed to modification or destruction due to grazing related activities (e.g. access to roosts provided by roads and trails and impacts due to other structural and non-structural projects).

No roosts are known from the action area, thus none would be affected. The action does not trigger this criterion.

3. Moderate to high density food plant habitat within 40 miles of any roost would be modified or destroyed or predisposed to modification or destruction due to excessive grazing use or seeding of exotic species (e.g. grazing use sufficient to cause downward trend in food plant habitat [ecological status] depending on site requirements); introduction of exotics that modify the habitat, such as Lehmann's lovegrass, modifying fire regimes).

Although proposed grazing is expected to affect saguaro recruitment, these effects are likely to be slight, as discussed above under criterion 3 for may affect determinations. No “excessive” grazing is proposed and no downward trend in saguaro populations is anticipated, although detection of such a trend is problematic, even with the monitoring proposed by BLM, as discussed in the Effects of the Action for the pygmy-owl. The BLM does not propose to introduce any exotic species. There is some potential that grazing and movements by cattle could introduce additional exotics to the Vekol Valley area; however, most exotics that are expected to cause a problem there are already present. The Service does not believe this criterion is triggered; however, if monitoring or other new information indicates otherwise, the BLM should reconsider its effects determination.

4. Food plant density, in areas of moderate to high densities within 40 miles of any roost, would be reduced by < 1.0 percent within 0.5 mile of new grazing related structural improvements (e.g. water facilities, pipelines, tanks, roads, corrals).

The proposed new water is in an area with few saguaros and thus its construction and subsequent use by livestock is unlikely to affect a reduction in food plant density. Proposed enclosure fences are also in areas with few saguaros, thus effects to bat food plants should be minimal. The action does not trigger this criterion.

5. Food plant density, in areas of moderate to high densities within 40 miles of any roost, would be reduced by < 10 percent due to new grazing-related non-structural improvements (e.g. vegetation treatments including prescribed burning).

No vegetation treatments or prescribed burning are proposed. The action does not trigger this criterion.

6. Flowers of food plants, in areas of moderate to high densities and within 40 miles of any roost, would be reduced by < 10 percent during the bolting and flowering period (4/15 to 9/15) due to herbivory.

This criterion was written primarily for agave flowers, which are attractive to cattle, if accessible. Although some *Agave deserti* occurs in the upland portions of the allotment, the primary food plant for the lesser long-nosed bat is the saguaro. Saguaro flowers are generally not accessible to cattle and would be reduced by much less than 10 percent, if at all, due to grazing activities. The action does not trigger this criterion.

CONCLUSION

The Service concurs with the BLM’s determination that the proposed action may affect, but is not likely to adversely affect the lesser long-nosed bat. We base this determination on the guidance criteria, as described above.

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